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(54) **FASTENING ELEMENT FOR THE WIPER  
ARM OF A VEHICLE WINDSHIELD WIPER**

(75) Inventor: **Jean-Marc Ritt**, Strasbourg (FR)

(73) Assignee: **Robert Bosch GmbH**, Stuttgart (DE)

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15/250.21

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**15/250.352, 250.21, 250.23, 250.202**  
See application file for complete search history.

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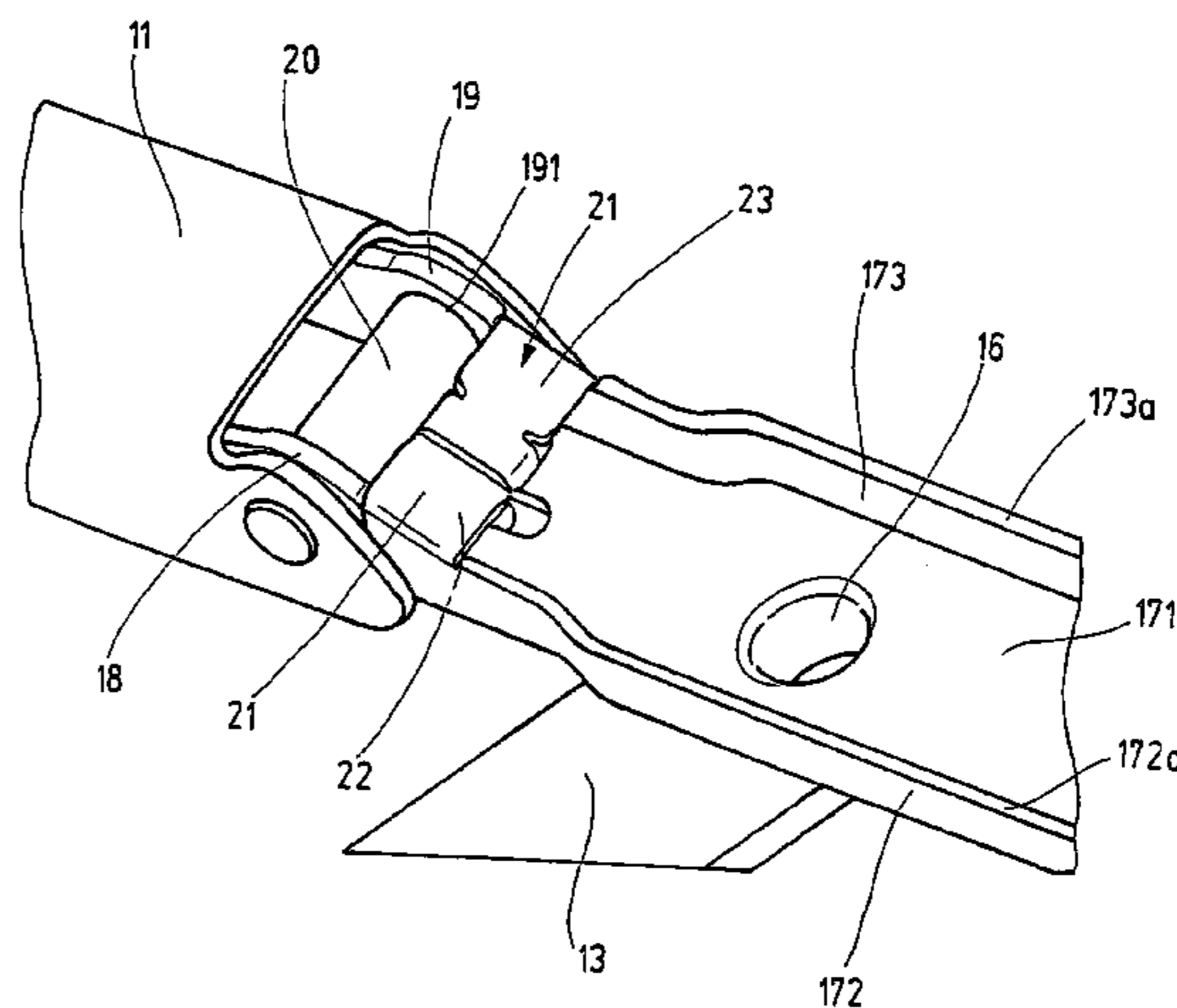
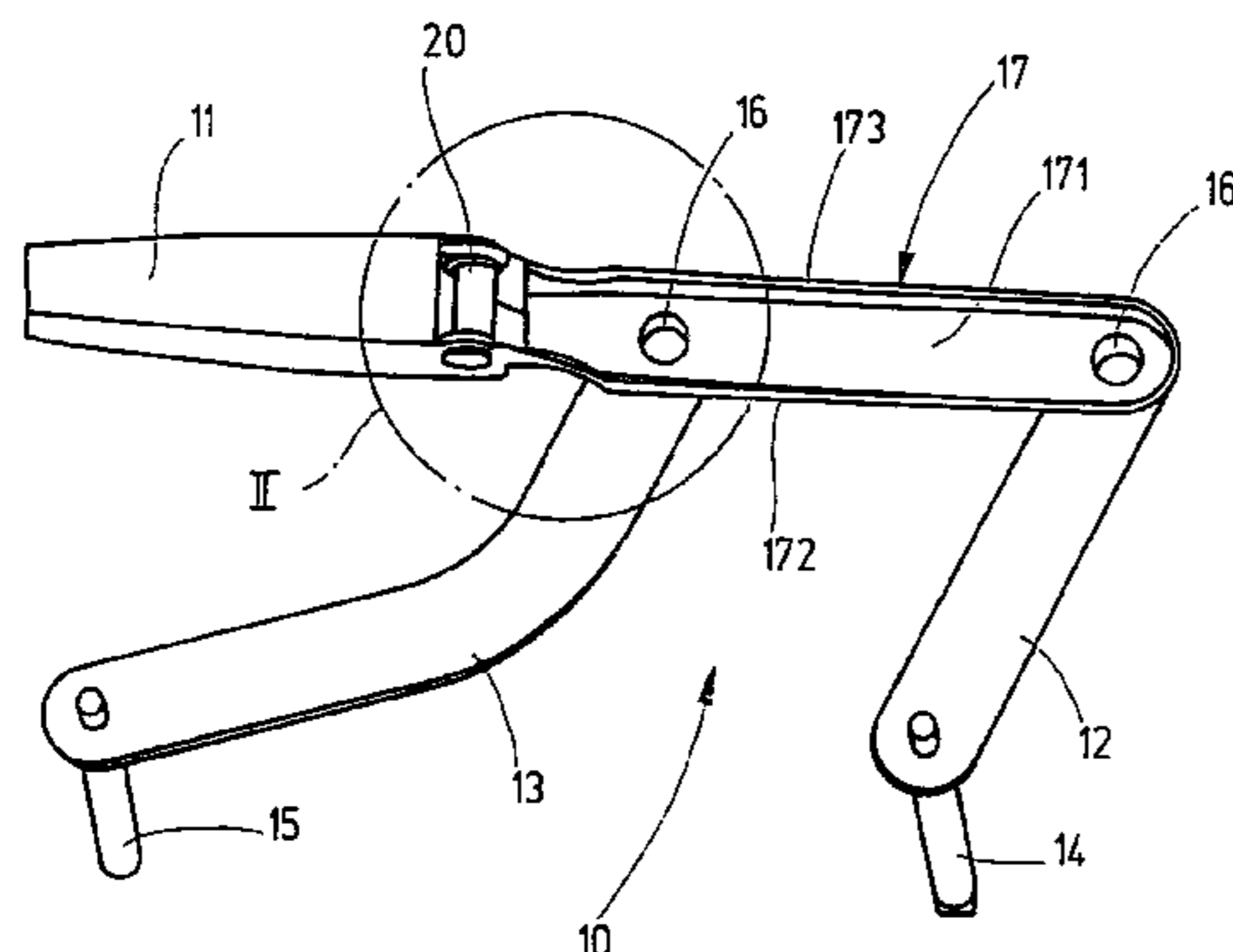
*Primary Examiner*—Gary K. Graham

(74) *Attorney, Agent, or Firm*—Michael J. Striker

(57) **ABSTRACT**

A fastening part for a wiper arm of a vehicle wiper is disclosed, which can be driven for the pivoting motion and which has a receptacle for the articulated connection of the wiper arm (11). For the sake of economical production of a lightweight fastening part of adequate rigidity, the fastening part is embodied as a sheet-metal part (17), with a substantially flat back (171) located in the pivoting plane and two side cheeks (172, 173), protruding approximately at right angles from the back, and a transverse reinforcement (21), which braces the upper edges (172a, 173a), remote from the back, of the side cheeks (172, 173) against one another is disposed in the transition region from the side cheeks (172, 173) to the ears (18, 19), in which the articulated connection of the wiper arm (11) to the fastening part is made (FIG. 2).

**5 Claims, 2 Drawing Sheets**



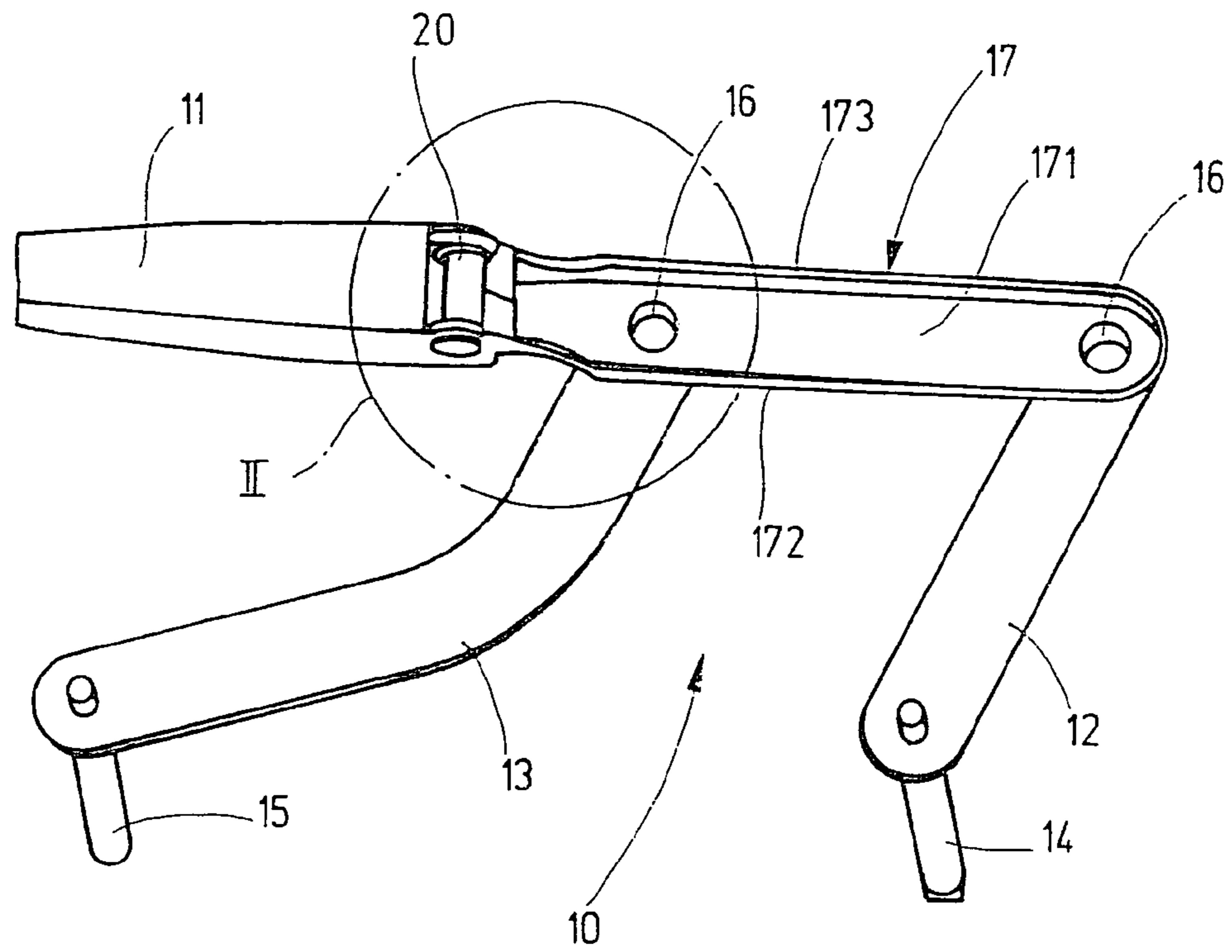


Fig.1

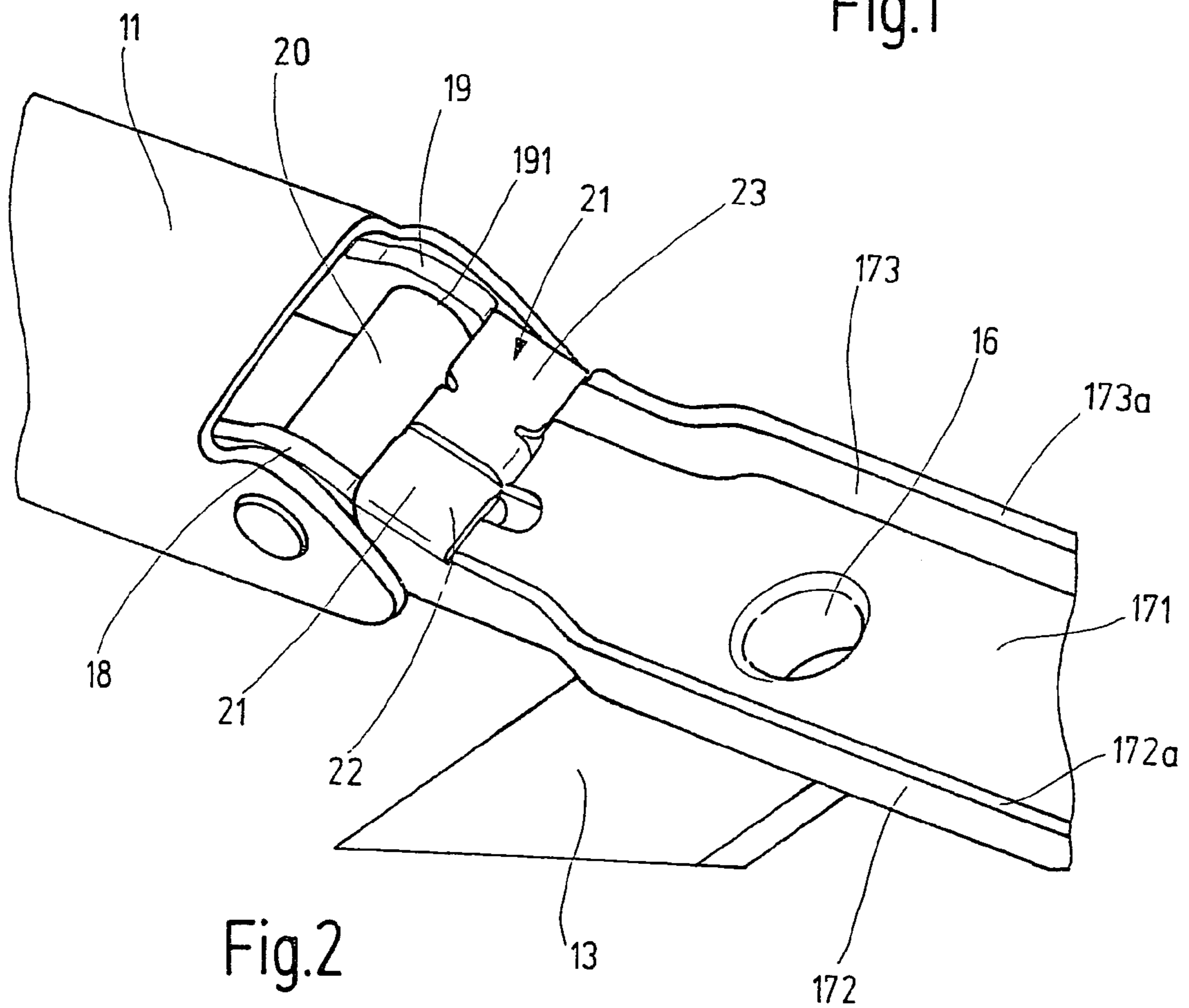
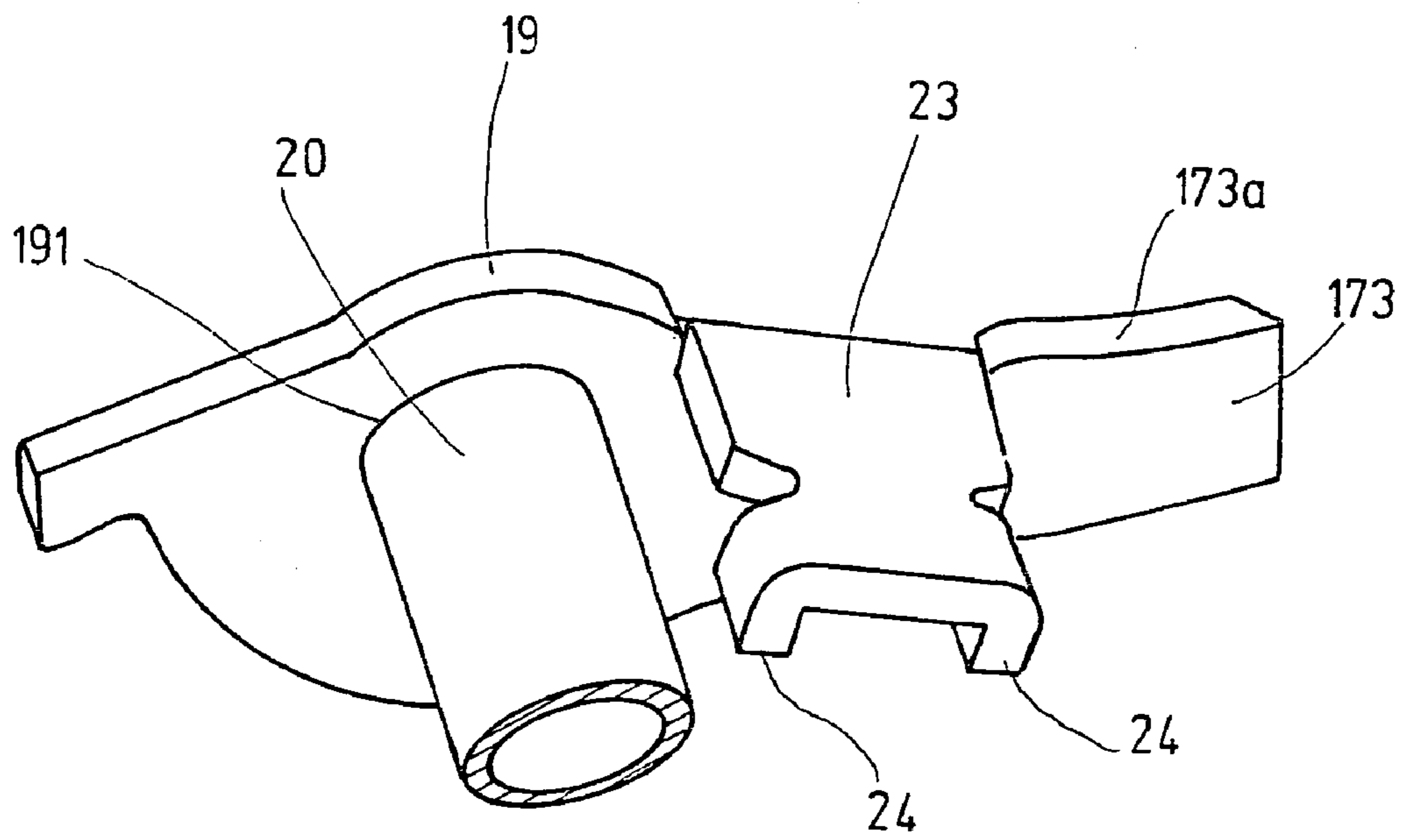
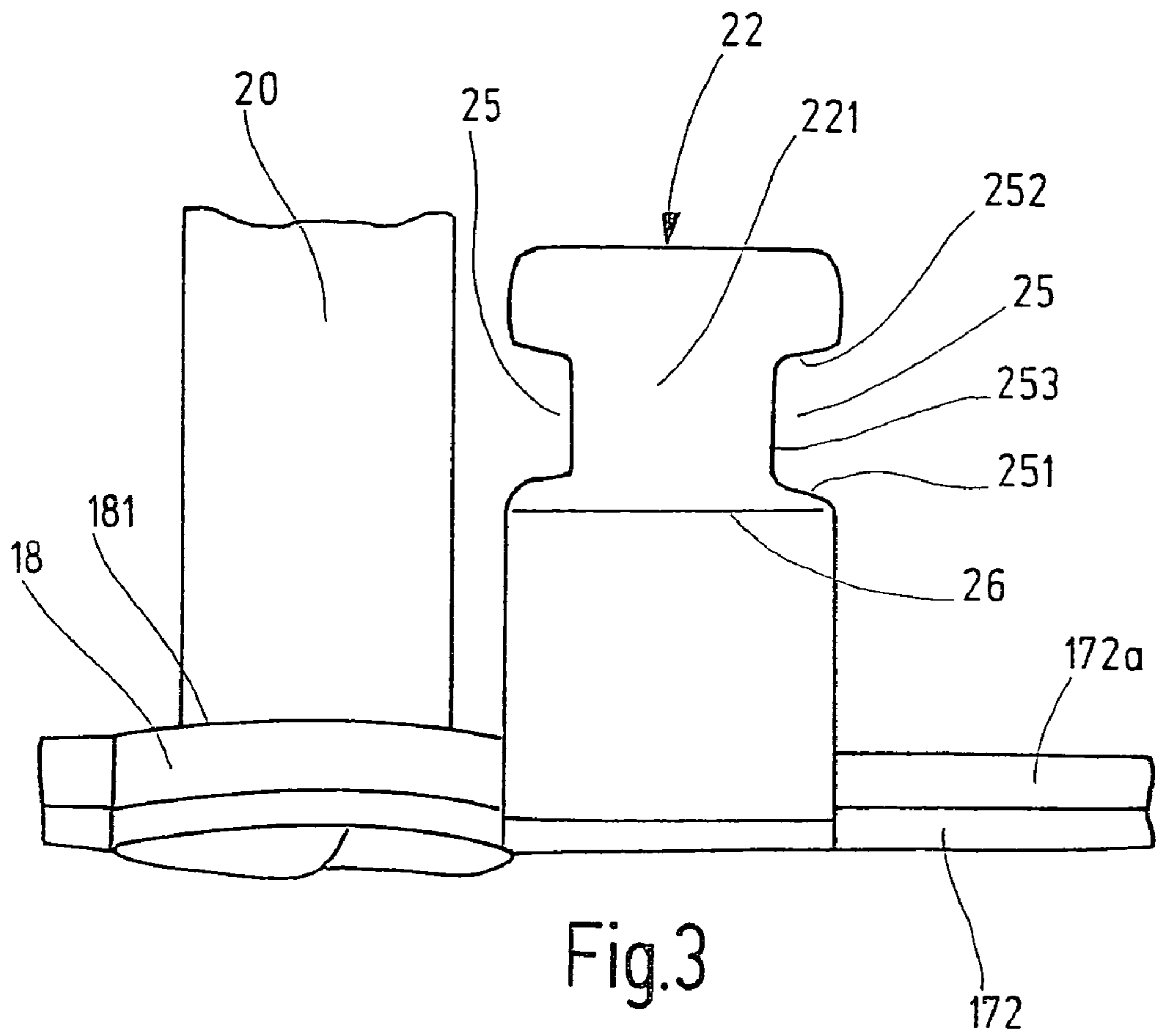


Fig.2



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## FASTENING ELEMENT FOR THE WIPER ARM OF A VEHICLE WINDSHIELD WIPER

### BACKGROUND OF THE INVENTION

The invention is based on a fastening part for a wiper arm of a vehicle wiper.

Known wipers for vehicle windows have a four-bar drive linkage and a wiper arm, which is pivotable by the drive linkage which and on its free end carries the wiper blade that is moved over the vehicle window by the pivoting motion of the wiper arm. The four-bar drive linkage has two pivot levers, which on one lever end are seated on an axle in a manner fixed against relative rotation, and also has the fastening part, acting as a coupling, which couples the two pivot levers together on their ends remote from their axle, each via a respective joint with a joint axis oriented parallel to the lever axles. One of the lever axles can be driven by means of a wiper motor, while the other lever axle is rotatably received in a support bearing. The fastening part forming the coupling is made from die-cast aluminum, and on its end toward the wiper arm it has a receptacle for the wiper arm pivotably supported therein, whose pivot axis is oriented approximately perpendicular to the joint axes and transversely to the longitudinal axis of the fastening part.

### SUMMARY OF THE INVENTION

The fastening part according to the invention for a wiper arm of a vehicle wiper, has the advantage that it can be produced economically as a sheet-metal part and can be lightweight. The back of the sheet-metal part, located in the pivoting plane, assures adequate rigidity in the coupling plane of the four-bar drive linkage, and this reliably prevents the fastening part from kinking, even if the wiper blade is temporarily sluggish. The transverse reinforcement assures a uniformly high rigidity of the sheet-metal part in the region of the wiper arm receptacle, so that even sheer forces occurring in this top region of the sheet-metal part that is offset parallel from the pivoting plane of the four-bar drive linkage upon pivoting of the wiper blade cannot cause any torsion or bending of the sheet-metal part.

In a preferred embodiment of the invention, the transverse reinforcement comprises a first tab, which is bent over approximately parallel to the back at the upper edge of one side cheek, a second tab, which bent over from the upper edge of the other side cheek until it rests on the first tab. The second tab has claws, bent over from its two longitudinal edges, that are pressed against the first tab. Such an embodiment of the transverse reinforcement is economical to produce and requires no additional parts.

In an advantageous embodiment of the invention, the first tab has lateral recesses, into which the claws bent over from the second tab dip. As a result, in the transverse direction of the sheet-metal part, the claws establish an additional positive engagement between the two tabs, thus reliably preventing a relative displacement of the two tabs even if extreme shear forces occur in impeded operation of the wiper.

In an advantageous embodiment of the invention, the boundary edges oriented toward one another of the recesses are chamfered on each long side of the second tab in such a way that their inside spacing from one another decreases toward the bottom of the recesses. Because of these slightly oblique recesses embodied with a decreasing width, a play

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between the tabs in the transverse direction of the sheet-metal part can be compensated for when the claws are pressed against them.

In an advantageous embodiment of the invention, the sheet-metal part along with the ears and tabs is stamped out of a sheet-metal plate and is deep-drawn in order to form the side cheeks.

### BRIEF DESCRIPTION OF THE DRAWINGS

The invention is described in further detail in the ensuing description in terms of an exemplary embodiment shown in the drawing. Shown in perspective are:

FIG. 1, in fragmentary form, a plan view on a wiper for a vehicle window with a four-bar drive linkage and with a wiper arm, shown in part;

FIG. 2, an enlarged view of the detail marked II in FIG. 1;

FIGS. 3 and 4, each, an enlarged view of a detail of a transverse reinforcement in the fastening part of the four-bar drive linkage of FIGS. 1 and 2.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The wiper for a vehicle window, shown in part and in perspective in FIG. 1, has a four-bar drive linkage **10** and a wiper arm **11**, which is driven by this linkage to execute a reciprocating pivoting motion and which on its free end has a wiper blade, not shown here, that it moves over the vehicle window in its pivoting motion. The four-bar drive linkage **10** includes two pivot levers **12** and **13**, which are each seated on one end in a manner fixed against relative rotation on a respective axle **14**, **15**, of which one axle can be put into a pivoting motion by means of a wiper motor, while the other axle is received in rotating fashion in a support bearing. On the ends remote from the axles, the two pivot levers **12**, **13** are each joined, via a respective joint **16** whose joint axis is oriented parallel to the axles **14**, **15**, to a fastening part representing a coupling. The fastening part is embodied as a sheet-metal part **17**, with a substantially flat back **171** located in the pivoting plane of the coupling, and with two side cheeks **172** protruding approximately at right angles from the back. The side cheeks **172**, **173**, opposite one another on the back **171**, merge, on the end of the sheet-metal part **17** toward the wiper arm receptacle, with protruding ears **18**, **19**, where they form the so-called top region, in which the wiper arm **11** is pivotably connected to a joint axle oriented approximately at a right angle to the axes of the joints **16** and to the longitudinal axis of the back **171**. To that end, in each of the ears **18**, **19**, a bore **181**, **191** is provided, through which a hinge bolt **20** can be passed rotatably, which in turn is fixed to the wiper arm **11**.

For stiffening the top region of the sheet-metal part **17**, a transverse reinforcement **21**, which braces the side cheeks **172**, **173** against one another, is provided in the transition region from the side cheeks **172**, **173** to the ears **18**, **19**, between the upper edges **172a** and **173a**, remote from the back, of the side cheeks **172**, **173**. As the enlarged view in FIG. 2 shows, the transverse reinforcement **21** comprises a first tab **22**, which is bent approximately at a right angle at the upper edge **172a** of one side cheek **172**, and which extends approximately parallel to the back **171**, and a second tab **23**, which is bent over at the upper edge **173a** of the other side cheek **173** until it rests on the first tab **22**. The second tab **23**, on both of its longitudinal edges, has downward-bent claws **24** (FIG. 4), which are pressed laterally against the

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first tab **22**. As FIG. 3 shows, the first tab **22** has lateral recesses **25**, into which the claws **24** dip while the second tab **23** is being bent over onto the first tab **22**. As can be seen from FIG. 3, the boundary edges **251**, **252**, oriented toward one another, of the recesses **25** are slightly chamfered, specifically in such a way that their inside spacing from one another decreases toward the bottom of the recess **25**. By means of these chamfered recesses **25**, the claws **24** on being pressed against the first tab **22** can be pressed more or less deeply into the recesses **25**, so that a play in the transverse direction of the sheet-metal part **17** between the claws **24** and the recesses **25** is compensated for. The first tab **22** preferably extends to near the side cheek **173** and can furthermore have a right-angle bend **26**, in such a way that its portion **221** bent at a right angle and receiving the bent-over second tab **23** is located at a deeper level, and thus the two tabs **22**, **23** resting on one another are flush at the surface.

The sheet-metal part **17**, with the ears **18**, **19** and tabs **22**, **23** and claws **24** and recesses **25**, is stamped or cut out of a sheet-metal plate and deep-drawn for forming the side cheeks **172**, **173**, which merge integrally with one another on the end of the sheet-metal part **17** remote from the wiper arm **21**.

In FIGS. 3 and 4, details of the transverse reinforcement **21** are shown enlarged. FIG. 3 shows the first side cheek **172** with the ear **18** and first tab **22** and also shows the hinge bolt **20** thrust through the bore **181**, and FIG. 4 shows the second side cheek **173** with the ear **19** and the second tab **23** and also shows the hinge bolt **20** thrust through the bore **191**. Once the sheet-metal part **17** has been stamped out, and the ears **18**, **19** have been set up, the first tab **22** is also bent over far enough that it extends approximately parallel to the back **171** of the sheet-metal part **17** (FIG. 3). At the same time, the right-angle bend **26** is made (FIG. 3). Now the second tab **23** is bent over from the side cheek **173** onto the first tab **22**, until the lateral claws **24** dip into the recesses **25** in the first tab **22** (FIG. 4). Once the second tab **23** is resting on the portion **221**, bent at a right angle, of the first tab **22**, the claws **24** are pressed by lateral pressure into the recesses **25**

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and in the process are pressed against the boundary edges **251** and **252** of the recesses **25** (FIG. 2).

The invention claimed is:

1. A fastening part for a wiper arm of a vehicle wiper, which is drivable for a pivoting motion and which has a recess for an articulated connection of the wiper arm (**11**), characterized by a sheet-metal part (**17**) having an essentially flat back (**171**) located in the pivoting plane and two side cheeks (**172**, **173**) protruding approximately at right angles from the flat back, which cheeks, on the end of the sheet-metal part (**17**) toward a wiper arm receptacle, merge with protruding ears (**18**, **19**) that carry the receptacle, and by a transverse reinforcement (**21**), in the transition region from the side cheeks (**172**, **173**) to the ears (**18**, **19**), that braces the upper edges (**172a**, **173a**), remote from the back, against one another, wherein the transverse reinforcement (**21**) includes a first tab (**22**), which is bent over approximately parallel to the back (**171**) at the upper edge (**172**) of one side cheek (**172**), and a second tab (**23**), which is bent over until it rests on the first tab (**22**) at the upper edge (**173a**) of the other side cheek (**173**), and which second tab has claws (**24**), bent over from its two longitudinal edges, which claws are pressed against the first tab (**22**).

2. The fastening part of claim 1, wherein the first tab (**22**) has lateral recesses (**25**), in which the bent-down claws (**24**) on the second tab (**23**) dip.

3. The fastening part of claim 2, wherein the boundary edges (**251**, **252**), oriented toward one another, of the recesses (**25**) are chamfered such that their spacing from one another decreases toward the bottom (**253**) of the recess (**25**).

4. The fastening part of claim 1, wherein the first tab (**22**) extends to near the opposite side cheek (**173**).

5. The fastening part of claim 1, wherein the sheet-metal part (**17**), with ears (**18**, **19**), tabs (**22**, **23**), recesses (**25**), and claws (**24**), is stamped out of a sheet-metal blank and deep-drawn for forming the side cheeks (**172**, **173**).

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